

M.Sc. Geoinformatics

Course Description and Learning Outcome

SEMESTER- I

Subject: PS01CGIN21 - Principles of Remote Sensing

Faculty: Dr. Himanshu Kapse

Course Description

To introduce concepts of remote sensing. It consists Physical principles of remote sensing, Sensors used and the various techniques to acquire spatial information through satellite. Also Image interpretation for various applications included.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- know how basic physical principles are used to sense spatial information remotely.
- understand active and passive techniques for sensing electromagnetic signals in different applications
- Image interpretation and its elements helps to understand the significance of information

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Course Description and Learning Outcome

SEMESTER- I

Subject: PS01CGIN22 - Principles Of Geographical Information Systems

Faculty: Unnati A. Patel

Course Description

The course introduces basics of Space Technology and Earth Geometry. The course provides knowledge of various types of GIS data and their sources. This course also provides knowledge regarding how these data can be useful for planning and decision making purpose. The course provides various types of spatial and non-spatial analysis that can be performed on data. This course also gives idea regarding components of map and how to generate map. The course provides knowledge to the students regarding how to manage GIS data and how to develop GIS project. It also provides project management skill of GIS.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts and principles of GIS
- Develop GIS applications
- Capable to manage GIS project
- Analyze spatial and non spatial data
- Understand what is map and how to prepare map
- Generate various kinds of map for planning and DSS.

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Course Description and Learning Outcome

SEMESTER- I

Subject: PS01CGIN23 - Principles and Applications of GPS

Faculty: Krunal B. Suthar

Course Description

The course introduces principles and Applications of GPS. The course introduces principles of GNSS, Detail information regarding signal construction of Global Position System (GPS) & receiver format. This course provides insight knowledge of Working of GPS & Indian Regional navigation satellite system (IRNSS). This course provides Information contain in side signals of GPS satellite, Different errors in GPS reading measurements.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Find location using lat-long & height anywhere on earth.
- Atmospheric Error correction using time domain.
- Coordinate measurement & Accurate time measurement at any location on earth using GPS receiver / GPS Mobile.
- Able to mapping, Sampling, Navigation of any kind Applications on earth.
- Able to access location in GPS enable device without internet connectivity.

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Course Description and Learning Outcome

SEMESTER- I

Subject: PS01CGIN24 - Advanced Programming Concepts & Data Structures

Faculty: Ashish Joshi

Course Description

The course introduces programming concepts. The course introduces syntax and examples of control structures and looping structures. This course provides knowledge of object oriented programming concepts. This course gives idea of various data structures like stack, queue, etc. and also provides knowledge of how to use this.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts and syntax of C and C++.
- Write any application of C and C++
- Solve any logical program
- Write application using control structure and looping constructs
- Implement OOPs concepts in an application
- Develop C++ application for any data structure.

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Course Description and Learning Outcome

SEMESTER- I

Subject: PS01CGIN25 - RDBMS & Client Server Computing

Faculty: Unnati A. Patel

Course Description

The course introduces basics of database management systems and Client Server Computing. This course provides knowledge of how to create and manage database objects. RDBMS provides insight knowledge of data management that can be helpful to the students of GIS to manage spatial and non spatial data. RDBMS also provides knowledge of procedural language of structural query language. Client server computing provides knowledge of how various computers are connected with each other. The course also provides knowledge of various techniques in which client and server are connected with each other.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts of Database Management System
- Execute any DDL, DML and DQL query
- Manage non spatial data easily
- Manage data in client server environment
- Write any PL/SQL block

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Course Description and Learning Outcome

SEMESTER- II

Subject: PS02CGIN21 - Digital Image Processing

Faculty: Unnati A. Patel

Course Description

The course introduces basics of Digital Image Processing. The course also provides knowledge of how to solve various types of errors from satellite image. This course gives idea regarding digital image interpretation. This course provides knowledge of various operations like image enhancement, Image mosaic, Image registration, Intensity Transformation and many more. This course teaches how various operations can be performed on an image. This course provides idea related to how digital image can be helpful for change detection and all. This course provides knowledge about various techniques of image compression and image segmentation.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts Digital Image Processing
- Perform image registration, image enhancement and histogram equalization
- Perform various operations on a satellite image like image mosaic and many more
- Perform change detection between two images
- Download various satellite images from bhuvan

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Course Description and Learning Outcome

SEMESTER- II

Subject: PS02CGIN22 - Spatial Analysis and Modeling

Faculty: Krunal B. Suthar

Course Description

The course introduces core concept on Spatial Analysis. The course teaches Modeling for analysis using spatial data, Rasterisation process, Vectorisation process, Cut &fill and view shade analysis. This course provides idea to Create final cartography digital map with statistics.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Surface mapping as well conversation using interpolation.
- Working with contours & TIN model for 3-D accurate data.
- Easily manage large scale geographic terrain condition from Digital Elevation model, TIN model.
- View shadeanalysis for watch tower &create hidden area for military purpose.
- Shortest path design on Google map / Digital network.
- Impact on business using Gravity model for location base services.

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Course Description and Learning Outcome

SEMESTER- II

Subject: PS02CGIN23 – Java Programming

Faculty: Ashish Joshi

Course Description

The course introduces basics of Java Programming. The course introduces basics as well as advanced programming concepts of Java. This course provides knowledge related to event handling, Visual Programming and many more things in Java. The course also provides knowledge of Applets and servlets.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts Java Programming
- Build basic application in Java
- Build database connectivity in Java
- Build visual application in Java
- Write java code for any application

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Course Description and Learning Outcome

SEMESTER- II

Subject: PS02CGIN24 - Web Programming

Faculty: Unnati A. Patel

Course Description

The course introduces basics of web programming. This course provides knowledge of web sites and how to build them. This course gives idea related to state management in website. It also provides knowledge of static and dynamic website. The course teaches how GIS web services can be useful in your own web site. It also teaches how google map services can be useful.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand basic syntax and programming of web development
- Develop static and dynamic website
- Develop website with data integrity
- Use google map services

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Course Description and Learning Outcome

SEMESTER- II

Subject: PS02EGIN22 - Disaster Management

Faculty: Krunal B. Suthar

Course Description

The course introduces Disaster management using Space Technology. The course provides knowledge regarding Geological (Earth quake, Landslide, Tsunami) disaster characteristics & Measurement. Hydro-meteorological (Flood, cyclone) disaster characteristics & Measurements are taught in this course. This course also covers Planning & execution for disasters, National policy, Gujarat state policy and guide lines. As a part of this course Case study of Indian Large disasters is taken.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the use of different Satellite data for disaster (mainly study area is INDIA).
- Students able to measure for pre-disaster phase , mitigation , and redevelopment
- Measuring system during impact and after the disaster.
- Indian Government National disaster management act(NDMA), Gujarat state Disaster management Act (SDMA), and financial mechanism for fund allocation.
- Roll of GIS experts, GoV , NGO and PPP model to reduce impact of Disaster.
- Student become good decision maker using GIS &Space base inputs

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Course Description and Learning Outcome

SEMESTER- III

Subject: PS03CGIN21 - Spatial Data Infrastructure & Web GIS Services

Faculty: Unnati A. Patel

Course Description

The course introduces basics of SDI and Web GIS Services. The course gives insight knowledge of use of spatial data at different level in the world. This course gives idea about how to build our own SDI. The course provides immense knowledge of web GIS services. It also teaches how various services can be useful in various environment. This course provides knowledge of standards related to spatial data and metadata.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts SDI and web GIS services
- Know relationship between SDI and development of SDI
- Build their own web GIS service
- Develop web GIS application
- Make use of existing web GIS services

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Course Description and Learning Outcome

SEMESTER- III

Subject: PS03CGIN22 - QGIS Tools and Applications Development

Faculty: Krunal B. Suthar

Course Description

The course introduces open source QGIS Software. Installation and integration with Grass GIS is covered in this course. This course introduces Graphic user interface and Different tool, Data creation in QGIS and editing and Plugins management and use. As a part of this course various services are also taken few of them are World Map service (WMS) / World Map Tile service (WMTS).

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the QGIS importance as open source software and its different tool.
- Digitization of any satellite imaginary for applications.
- Tool Development for different analysis.
- Open source geospatial forum data exchange formats.
- Plugin information, GeoTag image, thematic map, Map book Creation.
- GPX file analysis

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Course Description and Learning Outcome

SEMESTER- III

Subject: PS03CGIN23 - Visual Programming

Faculty: Unnati A. Patel

Course Description

The course introduces basics of .NET framework and C#. The course provides knowledge of syntax and programming concepts of C#. It teaches console application, window based application and web application. The course provides knowledge of various components of .Net framework. This course provides knowledge about windows forms and windows presentation foundation. The course also give idea about database access and management for .Net.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic syntax and programming concepts in C#
- Understand .Net framework functionality
- Write C# application
- Database access using C#

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Course Description and Learning Outcome

SEMESTER- III

Subject: PS03CGIN24 - Android & iPhone Applications Development

Faculty: Unnati A. Patel

Course Description

The course introduces basics of Android and iPhone application development. The course provides knowledge of components of android and use of them in application development. The course provides knowledge regarding syntax and programming concept of Android as well as iPhone. The course gives idea related to database handling in Android application as well as iPhone application.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic syntax and programming concepts of Android and iPhone application development
- Build basic Android application with the use of various widgets.
- Build mobile application for database access.
- Understand all the functionality of iPhone application development

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Course Description and Learning Outcome

SEMESTER- III

Subject: PS03EGIN22 - Geoinformatics Application in Utility Management

Faculty: Krunal B. Suthar

Course Description

The course introduces public utility using space base inputs. Importance of RS,GIS & GPS for Utility management is covered in this course. This course also provides SCADA & LIDAR Process integration of GIS. This course teaches Data manipulation & documenting work, Generating query and analysis of data. This course also provides knowledge of Planning & implement of utility services.

Learning Outcome / Capability Development

At the completion of this course, students should be able to

- Understand the basic concepts electricity, GAS, Water, telecommunication networks.
- Students learn How to plan for above utility for public using GIS system.
- Implement and monitoring& regular maintenance service for utilities.
- End consumer product model designing.
- Spatial coverage for utility services